HISTORY KEPT YES ☒ NO ☐	**ILLINOIS HIGHWAY INFORMATION SYSTEM** **STRUCTURE INFORMATION AND PROCEDURE MANUAL**	
NBIS REQUIRED YES ☒ NO ☐	ITEM NAME **SUBSTRUCTURE CONDITION**	ITEM NO. **60** PAGE **1 of 5** EFF. DATE **07/01/02**

	ISIS	MMIS
RESPONSIBLE FOR UPDATE	**District Local Roads**	**District Maintenance / Operations**
STRUCTURES	**Local**	**State**
UPDATE SCREENS	**(12) Inspection / Appraisals**	**(2) Inspection**
INQUIRY SCREENS	**(4) Inspection / Appraisals**	**(2) Inspection 1 of 2**

DESCRIPTION AND PURPOSE OF ITEM

This item describes the physical condition of piers, abutments, piles, fenders, footings or other substructure components as it affects the structural sufficiency of the bridge.

The substructure elements should be inspected for visible signs of distress, including evidence of cracking, section loss, settlement, misalignment, scour, collision damage and corrosion. These elements include stems, breastwalls, crash walls, columns & piles, caps, bearing seats, backwalls, wingwalls, fender systems and paint. The element ratings may be assigned using the rating scales described under “Element Ratings - General” (Item No. Composite, Page 1 of 1, following the "Condition ratings – General" Item No. 58-62. Also refer to Appendix E, form BBS-BIR-1). The element ratings do not necessarily have a direct effect on the overall condition rating. However, serious and extensive deficiencies may affect the rating of both the elements and overall condition ratings.

The rating given to Item 93B1 (Underwater Appraisal Rating) may have a significant effect on this item if scour or subsurface deterioration has substantially affected the overall condition of the substructure. The rating assigned to this item should be no greater than that given to Item 93B1. The rating for Item 113 (Scour Critical Evaluation) is unrelated unless significant scour has actually occurred at the bridge.

Integral-abutment wingwalls to the first construction or expansion joint shall be included in the evaluation. For non-integral superstructure and substructure units, the substructure shall be considered as the portion below the bearings except that it shall also include abutment backwalls. For structures where the substructure and superstructure are integral, the substructure shall be considered as the portion of the bridge below the intersection of the bottom of the superstructure with the vertical column or wall face. If the substructure has Steel Fracture Critical Members, the rating of the substructure should be no higher than the rating for types E1, E2, E3 or E4 of Item 92A1 as recorded in Item 93A1.

Needed repairs should be recorded on designated forms and reported to appropriate personnel in accordance with the policies of the maintaining agency.

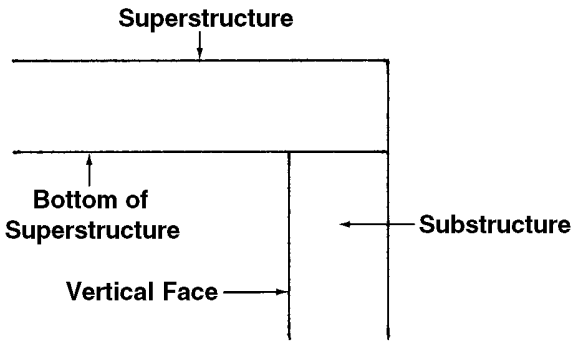
History is retained for this item based on each Inspection Date - Item 90.

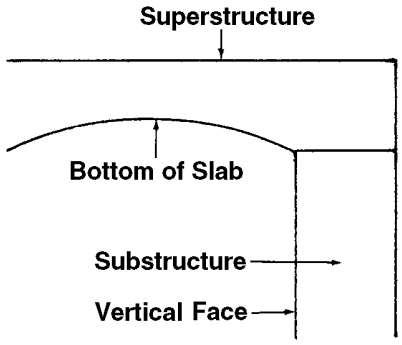
CODE AND SCREEN ENTRY INSTRUCTIONS

A one-digit field.

Rate and code the structure's condition in accordance with the "Condition Ratings - General" described on the preceding pages (Item No. 58-62 discussion, pages 1 of 2 and 2 of 2).

The Condition Rating Guides for Specific Substructure Types on the following pages (pages 3 of 5 through 5 of 5) are intended only to provide some assistance in recognizing typical kinds of substructure deficiencies and relating them to an appropriate Substructure Condition Rating.





All Substructure Types will use the same coding guidelines as described below for substructure rating codes of N, 9, 1, and 0 (zero).

FOR ALL SUBSTRUCTURE MATERIAL TYPES

CONDITION RATING GUIDES FOR CODES N, 9, 1 AND 0

Code	Description
N	Culvert.
9	New substructure.
1	Substructure in "imminent failure" condition requiring bridge closure or temporary measures to allow structure to remain open.
0	Substructure that has failed and is beyond repair, requiring bridge closure.

Condition Rating Guides for codes 2 through 8 pertaining to specific substructure material types are described on the following pages.

CONDITION RATING GUIDES FOR SPECIFIC SUBSTRUCTURE MATERIALS

CONCRETE OR MASONRY SUBSTRUCTURE

Code	Description
8	VERY GOOD. No significant defects. Shrinkage cracks, very light surface scaling, spalling or pop-outs which do not expose reinforcing steel. Insignificant damage caused by drift or collision with no misalignment and no corrective action warranted.
7	GOOD. Minor cracking, spalls or scaling with few incidences of exposed reinforcement with only surface rust. Minor scour may have occurred.
6	SATISFACTORY. Moderate deterioration or disintegration, spalls, cracking and leaching on concrete or masonry units with little or no loss of bearing area. Shallow, local scour may have occurred near foundations.
5	FAIR. Large portions of concrete or masonry units are spalling or scaling with exposed reinforcing steel possible. Extensive map cracking with leaching. Scour may be prominent, exposing subsurface elements, but the stability of the structure does not appear to be affected.
4	POOR. Active cracks in concrete and masonry units that indicate a reduction in the substructure unit's capacity to support the superstructure loads. Spalling or scaling is reducing the integrity of bearing seats. Major section loss of primary steel reinforcement. The stability of the unit may be affected by scour as evidenced by undermining of a spread footing type foundation unit or exposure of a large depth of piling below the streambed.
3	SERIOUS. Conditions similar to a condition rating of "4" but further advanced to the point where load restrictions are necessary. Settlement of the substructure may have occurred due to active scour. Temporary repairs or retrofits in place to maintain structural adequacy for legal loads.
2	CRITICAL. Conditions similar to a condition rating of "3" but advanced to the point where a reduced interval Special Inspection is required to allow bridge to remain open.

NOTE: For codes N, 9, 1 and 0 (zero) Condition Rating Guides pertaining to all substructure material types, refer to Item No. 60, Page 2 of 5.

CONDITION RATING GUIDES FOR SPECIFIC SUBSTRUCTURE MATERIALS

STEEL SUBSTRUCTURE

Code	Description
8	VERY GOOD. No significant defects. Very minor damage caused by drift or collision with no misalignment and not requiring corrective action.
7	GOOD. Some light surface rust. Minor scour may have occurred.
6	SATISFACTORY. Initial loss of steel section due to rust pitting may have occurred, but no effect on structural integrity of the substructure unit. Shallow, local scour may have occurred at foundation.
5	FAIR. Corrosion has caused moderate section loss but overall ability of substructure to support the structure is unaffected. Cracks may be present in non-critical areas. Scour may be progressive and/or is becoming more prominent with a possibility of exposing top of footing, but no misalignment or settlement noted.
4	POOR. Extensive section loss in critical areas of main steel members. Buckling or cracks may be present in critical areas of major structural elements. Extensive scour or undermining of footing may be affecting the stability of the unit but no significant settlement has yet occurred.
3	SERIOUS. Severe section loss in critical areas, localized failures possible. Bearing seat areas seriously deteriorated with considerable loss of bearing. Severe scour or undermining of footings affecting the stability of the unit with some settlement of the substructure. Temporary repairs may be in place to maintain structural adequacy for legal loads.
2	CRITICAL. Conditions similar to a condition rating of “3” but advanced to the point where a reduced interval Special Inspection is required to allow the bridge to remain open.

NOTE: For codes N, 9, 1 and 0 (zero) Condition Rating Guides pertaining to all substructure material types, refer to Item No. 60, Page 2 of 5.

CONDITION RATING GUIDES FOR SPECIFIC SUBSTRUCTURE MATERIALS

TIMBER SUBSTRUCTURE

Code	Description
8	VERY GOOD. No significant defects. Insignificant damage caused by drift or collision with no misalignment and not requiring corrective action. Scour is insignificant.
7	GOOD. Insignificant decay, cracking or splitting of timber. Minor scour may have occurred.
6	SATISFACTORY. Moderate decay, cracking or splitting of timber. Fire damage limited to surface scorching of timber with only insignificant section loss. Shallow, local scour may have occurred near foundations.
5	FAIR. Extensive decay, cracking or splitting of timber; a few secondary members may need replacement but primary members are performing their function as designed. Fire damage limited to surface charring of timber with minor section loss. Scour may be progressive and/or is becoming more prominent with a possibility of exposing subsurface elements but the stability of the structure does not appear to be significantly affected.
4	POOR. Serious decay, cracking, splitting or crushing of primary timber members that is reducing the load capacity of the substructure. Fire damage with section loss that has reduced the load carrying capacity of the substructure. Extensive exposure of timber piles as a result of erosion, reducing the penetration and affecting the stability or strength of the unit. Extensive scour or undermining of footing affecting the stability of the unit.
3	SERIOUS. A further progression of conditions as described under a code of “4”. Major damage to timber that substantially reduces the load carrying capacity of the member. Severe scour or undermining of footings affecting the stability of the unit. Settlement of the substructure may have occurred.
2	CRITICAL. A further progression of conditions as described under a code of “3”. Primary timber members crushed or split and ineffective. Scour sufficient that substructure is near state of collapse. Pier settled. Repairs, retrofits or posting in place to maintain safety.

NOTE: For codes N, 9, 1 and 0 (zero) Condition Rating Guides pertaining to all substructure material types, refer to Item No. 60, Page 2 of 5.